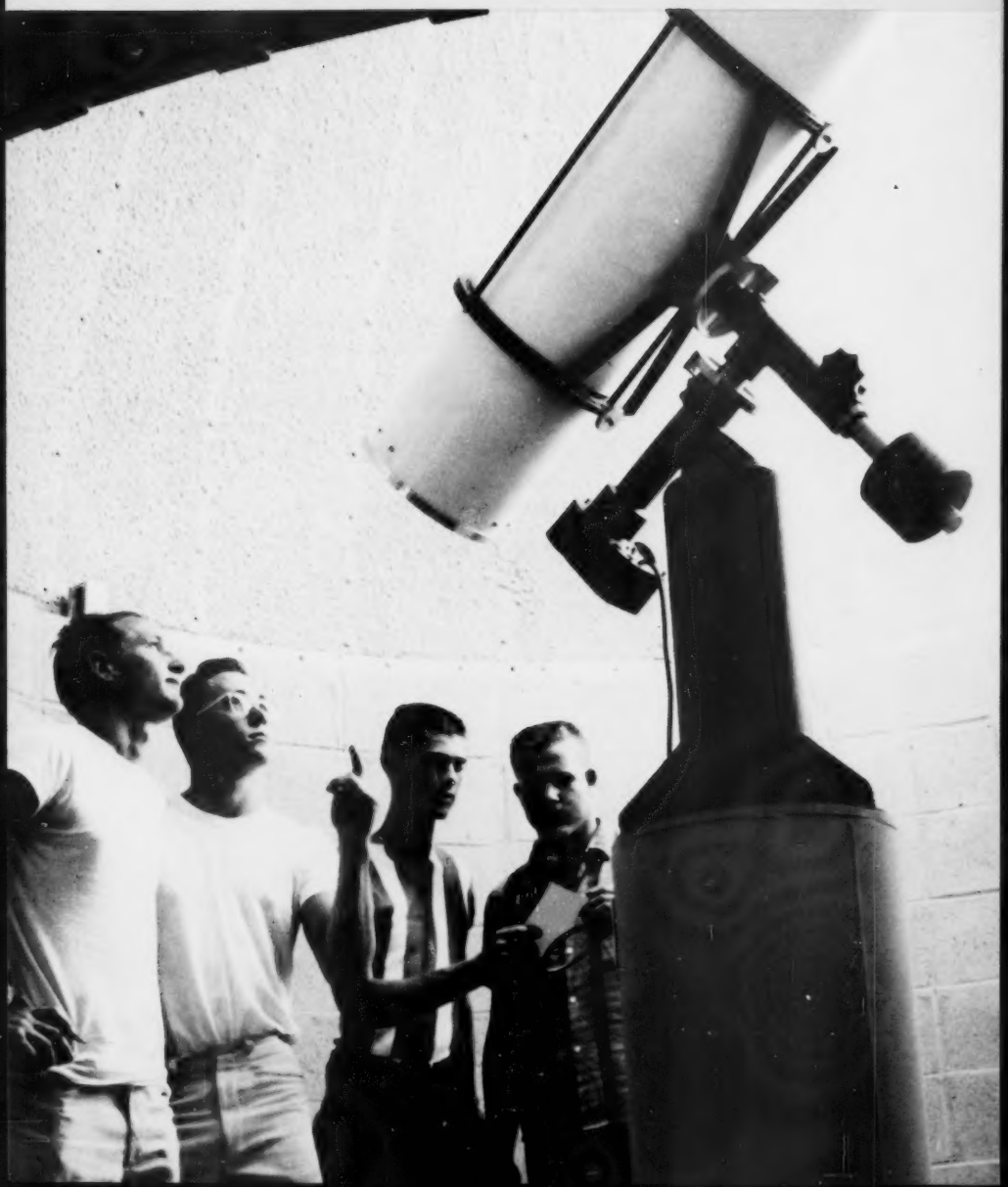
CALIFORNIA SCHOOLS

SEPTEMBER 1960



CALIFORNIA SCHOOLS

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Superintendent of Public Instruction

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CONTENTS

THE COVER ILLUSTRATION shows students with a reflecting telescope, part of a project developed by teachers and members of the senior class at Mt. Whitney High School, Visalia, with the assistance of National Defense Education Act funds.

A MESSAGE from the Superintendent of Public Instruction

GREETINGS

California classrooms fill with students this month as the nation's largest public school system begins its 109th year of instruction.

The fleeting weeks of summer leisure end as students and teachers go back to their books and lessons. For many teachers and administrators, summer leisure was combined with learning.

Summer workshops and courses have been more popular than ever. The best of the new ideas and new methods of education, which have been presented and studied, will be reflected in improved classroom learning.

Introducing changes in education during summer sessions is not new. For many years this practice has been employed as one important means of improving California public education. This year, however, an unusually large number of reforms and innovations were introduced, some in workshops with maximum enrollments which were sponsored by the State Department of Education.

As a result of all the work done during the summer, California schools will begin offering this year an educational program even stronger than has been previously offered. It is important that this fact be made known to the members of every community so that the support accorded our schools may also be stronger than it has been in the past.

Each new school year brings new faces and new problems to each classroom, as well as the promise of accomplishment which is the *raison d'être* of public education. Our educational accomplishment this year will be greater than ever before because we are determined to keep our schools abreast of the times. I am glad to welcome the new members to our educational team and to again greet the other members. I am sure that all will find the 1960-61 school year one of outstanding achievement.

RESULTS AND TRENDS IN CALIFORNIA SCHOOL DISTRICT BOND ELECTIONS, 1954-1959

HENRY W. MAGNUSON, *Chief, Bureau of Education Research*

At the request of the Governor's Office, the Bureau of Education Research of the State Department of Education asked all school districts in California to report on bond issue elections conducted from 1954-1955 through 1959-1960. Each school district was asked to report the date of any bond election it had held, the amount of the bond issue, the per cent of the vote in favor of the bond issue, and any election held a second time because of the failure of a prior bond election. In addition, each district was asked to report the approximate election date and amount of each bond issue planned for the future.

School Districts Reporting

Of the 1,721 school districts contacted in February 1960, through the offices of the county superintendents of schools, 1,683 responded. This was approximately 98 per cent of the California school districts. Approximately one-half (51 per cent) of the elementary school districts responding reported that they had not held bond elections in the 1954-1959 period; 29.9 per cent of the high school districts, 39.3 per cent of the junior college districts, and 15.9 per cent of the unified school districts also reported no bond elections had been held.

Bond Issues Approved

During the 1954-1959 period, 1,556 bond elections were held and in 1,183 (76 per cent) the bonds were approved. Out of this total number of elections 1,074 were held by elementary school districts and in 80.4 per cent of those the bond issues were approved; 287 were held by high school districts and in 64.1 per cent of those the bond issues were approved; 25 were held by junior college districts and in 84 per cent of those the bond issues were approved; 170 were held by unified school districts and in 67.1 per cent of those the bond issues were approved. Table 1 shows the number of school bond elections held from 1954 to 1959, and the per cent of all elections in which the bond issues were approved.

Bond Election Trends, 1954-1959

Since the 1954-1955 school year, the per cent of elections in which bond issues were approved has decreased consistently. During the 1954-1955 school year, 318 elections were held and in 82.7 per cent of them the bond issues were approved; in the 1955-1956 school year, 318 elec-

TABLE 1

NUMBER OF SCHOOL DISTRICTS OF EACH TYPE AND PER CENT OF ALL SCHOOL DISTRICTS THAT REPORTED SCHOOL BOND ELECTIONS, 1954-1959

By Type of School District and Election Results

Type of school district	Districts reporting		Bond elections held			
	Number	Per cent	Number	Bond issue approved	Bond issue not approved	Per cent in which bond issues were approved
Elementary	1,324	97.3	1,074	863	211	80.4
High school	224	99.6	287	185	102	64.5
Junior college	28	100.0	25	21	4	84.0
Unified	107	100.0	170	114	56	67.1
Total	1,683	97.8	1,556	1,183	373	76.0

tions were held and the bond issues were approved in 81.4 per cent; in the 1956-1957 school year, 291 elections were held and the bond issues were approved in 75.9 per cent; in the 1957-1958 school year, 231 elections were held and the bond issues were approved in 73.2 per cent; in the 1958-1959 school year, 287 elections were held and the bond issues were approved in 69.3 per cent; in the fall of the 1959-1960 school year, 111 elections were held and the bond issues were approved in 64.9 per cent. A total of 131 bond elections were scheduled to be held in the spring of this school year. There has been some year-to-year fluctuation in the per cent of the elections in which the bond issues were approved in the various types of school districts, but the general trend in election results was toward a decrease in bond issue approvals. Table 2 shows the number of school bond elections held during each of the school years, and the per cent of the elections in which the bond issues were passed in the various types of districts.

School District Size and Bond Issues Approved

The bond issues were more frequently approved in elementary school districts and high school districts with average daily attendance over 3,000, and in unified districts with average daily attendance over 5,000 than in districts of like type but with less average daily attendance. Table 3 shows the number of bond elections held during the period 1954-1959, in the various types of districts, except junior college districts, and the per cent of all the elections in which the bond issues were approved. The junior college districts were not included in this analysis, because elections were held in only 25 of the districts and 21 of these elections resulted in the bond issues being approved.

The per cent of the elementary school elections in which the bond issues were passed was lowest for the districts with 100 or less average daily attendance, 72.4 per cent, and highest for districts with over 3,000 average daily attendance, 86.3 per cent. In districts with average daily

TABLE 2

NUMBER OF SCHOOL BOND ELECTIONS EACH YEAR, 1954-1959, AND PER CENT OF SUCCESSFUL SCHOOL BOND ELECTIONS

By Type of School District

School year	Elections	Type of school district				Total
		Elementary	High school	Junior college	Unified	
1954-1955	Number	228	57	6	27	318
	Per cent in which bond issues were approved	86.0	68.4	83.3	85.2	82.7
1955-1956	Number	223	53	5	37	318
	Per cent in which bond issues were approved	85.2	69.8	100.0	73.0	81.4
1956-1957	Number	201	53	4	33	291
	Per cent in which bond issues were approved	80.6	66.0	75.0	63.6	75.9
1957-1958	Number	155	49	3	24	231
	Per cent in which bond issues were approved	77.4	63.3	100.0	62.5	73.2
1958-1959	Number	198	51	5	33	287
	Per cent in which bond issues were approved	76.8	54.9	60.0	48.5	69.3
1959-1960*	Number	69	24	2	16	111
	Per cent in which bond issues were approved	62.3	62.5	100.0	75.0	64.9
Totals	Number	1,074	287	25	170	1,556
	Per cent in which bond issues were approved	80.4	64.5	84.0	67.1	76.0

* Fall elections only.

attendance between those two extremes the per cent of approved bond issues increased. The elementary school districts that reported no bond elections in the 1954-1959 period, 51 per cent of all elementary school districts responding to the questionnaire, were primarily districts with very small average daily attendance. For example, among the 539 districts with less than 100 average daily attendance, only 98 bond elections were held and 72.4 per cent of these elections resulted in the bond issues being approved; 272 bond elections were held by districts with from 101 to 500 average daily attendance, and 77.2 per cent of these elections resulted in the bond issues being approved.

Among the 44 high school districts with from 1 to 300 average daily attendance, 19 held bond elections, and 68.4 per cent of these elections resulted in the bond issues being approved. The high school districts with from 301 to 900 average daily attendance were least successful of

TABLE 3

TOTAL NUMBER OF SCHOOL BOND ELECTIONS, 1954-1959, AND PER CENT IN WHICH BOND ISSUES PASSED

By Type and Size of School District

ELEMENTARY SCHOOL DISTRICTS

Elections	Average daily attendance						Total
	1-100	101-500	501-900	901-1500	1501-3000	3001 and over	
Number	98	272	170	129	172	233	1,074
Per cent in which bond issues were approved	72.4	77.2	80.6	80.6	81.4	86.3	80.4

HIGH SCHOOL DISTRICTS

Elections	Average daily attendance				Total
	1-300	301-900	901-3000	3001 and over	
Number	19	99	89	80	287
Per cent in which bond issues were approved	68.4	50.5	66.3	78.8	64.1

UNIFIED SCHOOL DISTRICTS

Elections	Average daily attendance				Total
	1-900	901-1500	1501-5000	5001 and over	
Number	40	23	63	44	170
Per cent in which bond issues were approved	67.5	52.2	63.5	79.5	67.1

the districts of various sizes in securing approval of their proposed bond issues. They held 99 elections and in only 50.5 per cent of them secured approval of the bond issues.

Only 40 elections were held by the unified school districts with from 1 to 900 average daily attendance and 67.5 per cent of those resulted in the bond issues being approved; 23 were held by those with 901 to 1,500

average daily attendance and the bond issues were approved in 52.2 per cent; 63 were held by those with 1,501 to 5,000 average daily attendance and the bond issues were approved in 63.5 per cent; and 44 were held by those with average daily attendance over 5,000, and bond issues were approved in 79.5 per cent. Of the 107 unified school districts in California, 26 (22.4 per cent) were organized during the 1954-55 to 1959-60 period.

Bond Issues Approved in Repeat Elections

Table 4 shows that 184 school districts held repeat elections and that 55 per cent of these elections resulted in the bond issues being approved.

TABLE 4

NUMBER OF REPEAT BOND ELECTIONS BY PER CENT OF VOTE FAVORABLE TO BOND ISSUE AND TYPE OF SCHOOL DISTRICT [1]

Number of elections held	184
Number of bond issues approved	101
Per cent of bond issues approved	55

Per cent of vote favorable to bond issue	Type of school district			Total elections
	Elementary	High school	Unified	
Bonds not approved				
Below 50	2	3	1	6
50	--	--	--	--
51	--	--	--	--
52	3	--	1	4
53	2	2	2	6
54	2	1	--	3
55	2	1	--	3
56	2	--	--	2
57	--	2	1	3
58	3	1	2	6
59	3	1	--	4
60	4	1	--	5
61	1	1	4	6
62	3	2	3	8
63	5	2	--	7
64	3	1	1	5
65	4	2	--	6
66 to less than 66⅔	5	3	1	9
Bonds approved				
66⅔ to 67	3	2	1	6
68	2	3	1	6
69	6	2	3	11
70	3	4	--	7
71	9	5	--	14
72	4	3	--	7
73	3	1	2	6
74	4	--	--	4
75	2	1	--	3
Above 75	22	5	10	37
Total	102	49	33	184

[1] Excluding junior college districts.

Of these elections, 102 were held by elementary school districts, 56.9 per cent resulting in approval of the bond issues; 49 by high school districts, 53.1 per cent resulting in approval of the bond issues; and 33 by unified school districts, 51.5 per cent resulting in approval of the bond issues. No repeat elections were held by junior college districts.

Portion of Total Vote Favorable to Bond Issues

Bond issues submitted to California voters must receive a two-thirds majority, rather than a simple majority, to pass. Tables 5, 6, 7, and 8

TABLE 5

ELEMENTARY SCHOOL DISTRICT BOND ELECTIONS, 1954-1959

Number of elections: 1,074 Total amount sought: $469,831,000
Bonds approved $382,805,000
Bonds not approved 77,334,000

Per cent of vote favorable to bond issue	Total amount (in thousands)	Number of elections by school year						Total elections
		1954-1955	1955-1956	1956-1957	1957-1958	1958-1959	1959-*1960	
Bonds not approved								
Below 50	$13,324	8	5	10	5	9	5	42
50	266	--	1	--	--	--	--	1
51	744	1	--	--	4	2	--	7
52	1,765	--	1	--	1	4	2	8
53	3,736	--	--	--	3	2	1	6
54	340	--	--	2	1	--	--	3
55	3,039	2	--	1	1	2	1	7
56	6,575	1	1	2	1	2	--	7
57	923	--	2	--	--	2	2	6
58	3,499	2	1	3	--	3	1	10
59	7,178	1	2	2	2	3	1	11
60	2,271	2	2	3	2	--	--	9
61	5,128	3	4	2	--	3	1	13
62	6,140	1	1	2	1	1	2	8
63	4,204	--	4	1	6	2	3	16
64	5,638	2	1	2	2	2	1	10
65	4,711	4	3	4	1	3	2	17
66 to less than 66⅔	7,853	2	2	1	4	4	1	14
Bonds approved								
66⅔ to 67	10,054	3	2	5	3	5	1	19
68	7,455	5	5	2	5	--	2	19
69	5,378	5	1	5	2	11	1	25
70	8,519	2	3	3	3	6	1	18
71	18,467	6	6	5	6	10	--	33
72	9,523	4	6	2	5	5	2	24
73	6,217	5	7	4	3	3	--	22
74	7,591	3	11	7	4	4	2	31
75	16,548	10	4	6	7	9	2	38
Above 75	293,053	144	139	114	78	92	28	595
Not indicated regardless of whether bond issue passed	9,692	12	9	13	5	9	7	55
Total	$469,831	228	223	201	155	198	69	1,074

* Fall elections only.

TABLE 6

HIGH SCHOOL DISTRICT BOND ELECTIONS, 1954-1959

Number of elections: 287 Total amount sought: $630,108,000

Bonds approved $480,304,000
Bonds not approved 135,414,000

Per cent of vote favorable to bond issue	Total amount (in thousands)	Number of elections by school year						Total elections
		1954-1955	1955-1956	1956-1957	1957-1958	1958-1959	1959-*1960	
Bonds not approved								
Below 50	$16,500	2	1	4	2	4	1	14
50	299	--	--	--	1	--	--	1
51	500	--	--	--	--	1	--	1
52	9,000	--	--	--	1	--	--	1
53	1,457	--	1	--	1	2	--	4
54	600	1	1	--	--	--	--	2
55	6,979	--	--	1	1	2	--	4
56	5,000	--	1	2	1	--	--	4
57	7,970	1	2	2	--	3	--	8
58	2,532	--	2	1	--	--	--	3
59	5,000	2	1	--	--	1	1	5
60	650	--	--	--	--	--	1	1
61	6,037	--	--	1	1	1	3	6
62	6,444	3	--	--	1	1	--	5
63	19,790	2	--	--	1	3	1	7
64	19,983	2	1	1	1	3	1	9
65	9,213	1	4	--	--	1	1	7
66 to less than 66⅔	17,460	2	--	3	4	--	--	9
Bonds approved								
66⅔ to 67	9,368	--	2	1	--	1	1	5
68	5,307	2	--	--	1	1	--	4
69	6,984	1	2	--	2	4	--	9
70	15,476	2	--	2	4	1	3	12
71	32,145	7	2	2	3	2	1	17
72	14,785	2	1	1	1	2	--	7
73	6,680	--	--	1	2	--	--	3
74	12,075	3	--	--	1	4	--	8
75	18,216	3	5	--	--	--	1	9
Above 75	359,268	19	24	26	15	12	9	105
Not indicated regardless of whether bond issue passed	14,390	2	3	5	5	2	--	17
Total	$630,108	57	53	53	49	51	24	287

* Fall elections only.

show the per cent of the vote in favor of the bond issues, the amounts of the proposed issues, and the number of elections held each year, 1954-55 to 1959-60, for each of the four types of school districts—elementary school districts, high school districts, unified school districts, and junior college districts.

Amount of Bond Issues

In the 1,074 elections held by elementary school districts during the 1954-1959 period, bond issues amounting to approximately 470 million

dollars were voted on. Of this total, issues amounting to approximately 385 million dollars were approved. In 43 of the elections the bond issues did not receive a simple majority of the votes cast; in 595, the bond issues received better than 75 per cent of the vote cast; and in 57, the bond issues received between 63 and 66 per cent of the vote cast.

TABLE 7

JUNIOR COLLEGE DISTRICT BOND ELECTIONS, 1954-1959

Number of elections: 25 Total amount sought: $88,751,000

Bonds approved $76,911,000

Bonds not approved 11,840,000

Per cent of vote favorable to bond issue	Total amount (in thousands)	Number of elections by school year						Total elections
		1954-1955	1955-1956	1956-1957	1957-1958	1958-1959	1959-*1960	
Bonds not approved								
Below 50	$3,600	1	--	--	--	--	--	1
50	2,940	--	--	--	--	1	--	1
55	1,000	--	--	1	--	--	--	1
61	4,300	--	--	--	--	1	--	1
Bonds approved								
66⅔ to 67	3,500	--	--	--	--	--	1	1
68	2,000	--	1	--	--	--	--	1
71	936	--	1	--	--	--	--	1
72	7,840	--	--	1	--	1	1	3
73	470	1	--	--	--	--	--	1
75	10,965	--	1	1	2	1	--	5
Above 75	51,200	4	2	1	1	1	--	9
Total	$88,751	6	5	4	3	5	2	25

* Fall elections only.

In the 287 elections held by high school districts, bond issues amounting to approximately 630 million dollars were voted on. Of this total, issues amounting to approximately 480 million dollars were approved. Although 15 of the bond elections failed to draw a simple majority of the votes cast, 105 (approximately one-third) of the elections carried by better than 75 per cent of the vote. Approximately 11 per cent (31) of the elections drew between 63 and 66 per cent of the votes cast.

In the 25 elections held by junior college districts, bond issues amounting to approximately 89 million dollars were voted on. Of this total, issues amounting to approximately 77 million dollars were approved. Of the four bond elections that failed, two failed to gain a simple majority, and two received 55 and 61 per cent respectively, of the votes cast. Nine of the bond issues were supported by more than 75 per cent of the vote.

In the 170 elections held by unified school districts, bonds amounting to approximately 475 million dollars were voted on. Of this total, issues

TABLE 8

UNIFIED SCHOOL DISTRICT BOND ELECTIONS, 1954-1959

Number of elections: 170 — Total amount sought: $474,548,000
Bonds approved — $376,106,000
Bonds not approved — 91,532,000

Per cent of vote favorable to bond issue	Total amount (in thousands)	Number of elections by school year						Total elections
		1954-1955	1955-1956	1956-1957	1957-1958	1958-1959	1959-*1960	
Bonds not approved								
Below 50	$7,187	--	2	--	2	3	--	7
50	--	--	--	--	--	--	--	--
51	2,250	1	--	--	--	--	--	1
52	4,695	--	--	--	1	1	2	4
53	4,685	--	--	--	2	1	--	3
54	--	--	--	--	--	--	--	--
55	2,725	--	1	--	1	--	--	2
56	2,500	--	--	--	--	1	--	1
57	3,000	--	1	1	--	1	--	3
58	5,420	--	1	--	2	1	1	5
59	350	--	1	--	--	--	--	1
60	13,218	--	1	3	1	--	--	5
61	13,272	--	--	1	--	3	1	5
62	5,383	1	--	1	--	1	--	3
63	2,300	--	1	1	--	1	--	3
64	6,682	--	1	1	--	1	--	3
65	1,675	--	--	1	--	1	--	2
66 to less than 66⅔	16,190	1	--	2	--	1	--	4
Bonds approved								
66⅔ to 67	9,705	1	2	1	1	--	1	6
68	2,985	1	1	--	1	1	--	4
69	4,416	2	--	1	1	1	--	5
70	9,871	1	2	1	--	1	--	5
71	4,160	--	--	--	--	--	1	1
72	29,395	--	--	--	--	2	2	4
73	16,181	2	2	2	1	1	--	8
74	51,700	--	1	--	1	--	1	3
75	7,045	--	2	--	1	1	--	4
Above 75	240,648	16	18	15	9	8	6	72
Not indicated regardless of whether bond issue passed	6,910	1	--	2	--	2	1	6
Total	$474,548	27	37	33	24	33	16	170

* Fall elections only.

amounting to approximately 376 million dollars were approved. Seven of the issues failed to receive a simple majority of the votes cast; 72 of the bond issues were supported by more than 75 per cent of the vote; and 11 (or 6 per cent) of the bond issues received between 63 and 66 per cent of the votes cast.

Proposed Bond Elections

A total of 131 bond elections were scheduled for spring of the 1959-1960 school year—89 by elementary school districts, 27 by high school districts, 13 by unified school districts, and 2 by junior college districts. Plans for bond elections to be held during the 1960-1961 school year were reported by 44 school districts; by 14 school districts for the 1961-1962 school year; and by four school districts for elections to be held in the 1962-1963 and 1963-1964 school years. Many districts indicated that they would likely hold bond elections but had not formulated plans for the elections. Since an average of 280 elections were held annually from 1954-1960, it may be assumed that a similar average will be maintained in future years.

The California Committee on High School Mathematics Courses, which was organized by the Bureau of Secondary Education, Frank B. Lindsay, Chief, met in Santa Barbara December 14-16, 1959. This meeting was devoted to study of the nature and content of high school mathematics courses for the express purpose of determining what revisions were needed to make the courses meet present demands. In this meeting the committee, which was composed of representatives of some principal groups of college and university mathematicians especially interested in the content of high school mathematics courses,[1] gave careful consideration to the results of the most recent studies in the field of mathematics. Particular attention was given to the proposals made by the School Mathematics Study Group, Yale University; the University of Illinois Committee on School Mathematics; and the Commission on Mathematics of the College Entrance Examination Board.

A tentative report of the agreements reached in the meeting was prepared by William H. Meyer who acted as moderator during the various sessions. This report was then submitted to the members of the committee for study and suggested revision.

A workshop was then held in Santa Barbara June 20-30, 1960, for high school mathematics teachers to consider the report of the committee and to study the available materials that might be used in courses which were revised according to the committee's recommendations. This workshop was directed by Dr. Meyer. It was attended by 80 teachers who were selected by the superintendents of the districts in which they taught, at the invitation of the Bureau of Secondary Education, California State Department of Education.

The final report of the California Committee on High School Mathematics Courses appears on the opposite page. The faculties of all California secondary schools should profit from study of the report.

[1] The members of the Committee On High School Mathematics Courses are: Harold M. Bacon, Professor of Mathematics, Stanford University; E. G. Begle, Executive Director, School Mathematics Study Group, Yale University; Paul H. Daus, Professor of Mathematics, University of California, Los Angeles; Howard F. Fehr, Head, Department of Teaching Mathematics, Teachers College, Columbia University; John L. Kelley, Chairman, Department of Mathematics, University of California, Berkeley; Paul J. Kelley, Chairman, Department of Mathematics, University of California, Santa Barbara; Karl Menger, Professor of Mathematics, Illinois Institute of Technology, Chicago; David Merriell, Assistant Professor of Mathematics, University of California, Santa Barbara; William H. Meyer, Director of Undergraduate Studies in Mathematics, University of Chicago; H. Stewart Moredock, Chairman, Division of Mathematics and Science, Sacramento State College; Lewis F. Walton, Professor of Mathematics, University of California, Santa Barbara; and R. L. Wilder, Research Professor, University of Michigan; and Past President, American Mathematical Society.

REPORT OF THE COMMITTEE ON HIGH SCHOOL MATHEMATICS COURSES

WILLIAM H. MEYER, *Moderator*

I. The General Ground and Purpose of Our Deliberations

We are living in a time of phenomenal expansion of exact knowledge. Not only is such knowledge changing in bulk, it is changing in character as classical distinctions fade between fields and as methods of one field come to be applied in another. Mathematics has, of course, shared notably in this expansion and alteration. Today many parts of exact science, for example, physics, are largely dependent on mathematical methods. Today university mathematics curriculums are strikingly different from what they were in 1940—different even in the first undergraduate years, where traditional courses have been dropped or combined, new mathematical subject matter introduced, and increased emphasis given to the abstract and the rigorous. Note, for example, that universities are steadily reducing their offerings in precalculus mathematics, and systematically upgrading the calculus they give.

Again, we see our American community rapidly becoming a highly schooled society whose central and most productive resource is knowledge. Correlative with this profound change is an accelerating demand for mathematics and a multiplication of theories useful in applying mathematics. To the growing but familiar demands for mathematics from exact science and technology have been added new demands from the biological and the behavioral sciences—witness the interest in the tools of probability and mathematical statistics. The development of electronic computing and of operations research techniques has increased dramatically the number of fields where it is worthwhile to devise mathematical models, so that now we also have demands for mathematics from medicine, linguistics, biochemistry, business management, and the like. Among new theories useful in applied mathematics may be mentioned experimental design and experimental inference, quality control, factor analysis, cybernetics, information theory, game theory, and programming.

All these developments are comparatively recent. While their ultimate consequences are hard to estimate now, their first disturbing effects on our high school mathematical education are quite apparent. Already a severe gap has opened between traditional school mathematics and university mathematics. Already there is widespread concern for a more

complete and efficient school mathematics program than the familiar curriculum affords. The training of the present generation of school mathematics teachers suddenly seems inadequate, the recruitment of well-trained young people into teaching grows constantly more troublesome. And a formidable obstacle is now interposed to all attempts at remedial action, namely, an unprecedented difficulty in gauging what today's high school student or prospective teacher will require of his mathematical training 15 or 20 years hence.

Even if it could, school mathematics must not be allowed to continue unchanged under such conditions. We therefore took as our committee's chief business the formulation of recommendations that look to a new high school mathematics program and to some new institutional arrangements for developing that program. Sections IV and V of this report are devoted to these recommendations.

The recommendations we made stemmed from our common judgments on school education, on the nature of mathematics, the values of mathematics, and the expanding social role of mathematics; and they have as their collective intent to mark out directions in which mathematics teachers at all levels can work to revivify school mathematics. In our view, to neglect any boy's intellectual needs for mathematics, or corrupt and dissipate his innate mathematical powers, is to undermine what our schools seek foremost to confirm—his right to full personal development. In our view, to default the social demands for mathematics is, quite literally, to cripple and endanger American society. And in our view, to obviate these dangers and re-establish the great purposes of mathematics in our school curriculum it is necessary first of all to mobilize and focus the talents, the energies, the devotion of our mathematics teachers. If the present report helps to this end, the committee will be well satisfied.

II. The Specific Basis of Our Recommendations

To a significant extent, the general principles which guided our discussion were shaped by the considerations set forth in Section I. We mentioned there the great expansion of mathematics proper. What does this imply for mathematical education? Mathematics can be learned at any time, as interest and background permit. Only 20 years or so—from first grade to the Ph.D.—are available to teach the vast bulk of mathematical knowledge. There being thus more time for learning than for teaching, it is obvious that the mathematics program must deal efficiently with matters that are clearly central. We therefore took it as a principle that the new school mathematics program must treat just the fundamental concepts and disciplines of mathematics, and just those essential procedures of the subject which most vividly convey the spirit and values of mathematics; and further that the organization and treatment of these matters must reflect the basic unity of mathematics.

We cited earlier the expanding social role of mathematics. This expansion indicates that we must increase the number of mathematics students at all levels. It might also be thought to imply that the school program should be centered on applications of mathematics. But the school aims to educate a student, not merely condition him; the skillful use of a tool implies some understanding of it; and what tools the future fashions out of mathematics cannot be known now. These observations persuaded us that the best response to our society's continuing need for mathematics is to keep the purposes of the new school mathematics program strictly within mathematics and to give applications of mathematics a clear pedegogical relation subordinate to these purposes.

Again, as our remarks in Section I implied, continuance of growth and change in mathematics and its uses is inevitable. This suggested to us that the new school mathematics program should be flexible and self-revising, and its teachers competent to adjust the program to new requirements. It is pointless to create a new program only to have it die of the old diseases.

The locus of our discussion was grades seven through twelve, with particular attention to grades nine through twelve. In subject matter terms, this means the mathematics taught after finite-decimal arithmetic and before regular "limit" calculus. In selecting mathematical concepts and methods to be taught in these grades, we were guided by a conviction that what is taught should be interesting in itself, useful in various parts of mathematics and in other fields of science, and preparatory to mathematical matters which properly come after the twelfth grade. In organizing into courses the concepts and methods selected, we were guided by our experience as teachers, by logical and psychological connections in the material, and by a desire to avoid abrupt and radical departure from the curriculum now in force. It was this last consideration, incidentally, which kept us from implementing wholesale our belief that mathematics is one subject, best learned as one subject whose parts reinforce each other and advance together.

Our recommendations on subject matter and sequence for a new school mathematics program were made in the light of all these principles.

The considerations of Section I, together with the principles just listed, also have implications for administration of school mathematics. We shall mention some of these implications in connection with our recommendations in Section IV on institutional arrangements.

III. Concerning the Recommendations Themselves

The first thing to keep in mind about our recommendations is that they were not designed to cover all the important aspects of school mathematics. A thorough reconsideration of the school mathematics program would involve examining the aims of that program, the choice

of subject matter and of materials and procedures for achieving these aims, the relations the program bears to other parts of the school curriculum, modes of evaluating and revising the program, and the like. Our discussion did not pretend to such thoroughness. We confined ourselves largely to mathematics, and in particular to selection and organization of subject matter, as the area in which our views might be most useful. Our immediate aim was to upgrade the content of the school mathematics program. Our long-run aim was to furnish an organized basis of relevant subject matter which could sustain continuous curricular experimentation looking to a unitary mathematics program modern in content, in pedagogy and in spirit.

Now, it is one thing to say *what* mathematics should be taught in a school program, and quite another to suggest *how* it should be taught. Fundamentally, this "how" is a matter of the kind of activity and experience to be fostered in students who proceed through the program. Since it would be inexcusable of us not to indicate at least our major views on such a crucial aspect of school mathematics, we now do so as follows: The values of mathematics appear in the content of its theorems and in the procedures of mathematical experiment and discovery seen in actual mathematical research. These procedures enter the school mathematics program by way of problem-solving. In our view, problem-solving is the unique form of mathematical activity by which a student acquires the values and powers of mathematics. To this emphasis on problem-solving activity we add another: an emphasis on the visual, the concrete, the intuitive, the heuristic as the primary ground for mathematical experience. We do not doubt that these pedagogical principles, seriously and consistently applied, would by themselves revitalize school mathematics to an extraordinary degree.

In the last analysis, recommendations like ours accomplish nothing without the teacher in the classroom: it is he who directly engages the student with mathematics and who directly exemplifies its values. The preparation of our report has seemed worthwhile to us precisely because California has a corps of dedicated mathematics teachers anxious to upgrade their subject and its presentation, and state and district education officers eager to support them in such an enterprise. These are the people who, between them, will have to modify, adapt and implement what we have recommended; and they are the people our report ultimately had in mind. Teachers who set about relating our recommendations to the actual school situation can expect to find themselves in need of some retraining in mathematics; they will also find themselves entering upon a challenging educational task whose execution requires imagination and creativity of a high order. Education officers seeking to promote a revision of school mathematics can expect to find a different order of insight and administrative flexibility required of them; and they should see to it that teachers working at such revision

have time and opportunity to carry their efforts to proper fruition, and have every encouragement as they undertake to retrain themselves for the critical job ahead.

A last remark. We prepared our recommendations with a knowledge of the work of other groups concerned with school mathematics, notably the School Mathematics Study Group, and the Commission on Mathematics of the College Entrance Examination Board. While it seemed best to us to make our recommendations self-contained, we did not hesitate to cite appropriate portions of this other work where we felt it could be helpful.

IV. Our Recommendations for the School Mathematics Program

This section has the following organization: Part 1 presents the general recommendations on mathematical content; Part 2, those on mathematical and didactic procedures; and Part 3, those on curriculum policies. In formulating these recommendations it proved convenient to view both grade twelve and grades seven and eight from a base consisting of grades nine, ten, and eleven; Part 4, therefore, adds some further particulars on grades seven and eight, and Parts 5 through 8 do the same for the remaining four grades in succession. It also proved convenient to frame our recommendations on mathematical content primarily with reference to the college-capable student; some of the recommendations in Part 3 about curriculum policies suggest how the not-college-capable student should be related to the proposed new program.

1. *Recommendations concerning mathematical content*

a. We recommend that all high school students who are college-capable should study

Algebra, through complex numbers

Plane geometry, together with the basic concepts of solid geometry

Selected elementary functions, including circular functions and their applications to trigonometry, to vectors, and to complex numbers

This recommendation is not to be construed as urging a change in the number of mathematics units required for graduation from high school.

b. In connection with these studies we recommend specifically that the terminology and operations associated with sets be introduced early and used systematically; that inequalities be studied as well as equations; that some co-ordinate geometry, as well as essentials of solid geometry, be incorporated with plane geometry; that mathematical induction be a part of the work in algebra; and that lengthy numerical computations, especially those found in trigonometry, receive distinctly less emphasis.

c. We recommend that all college-capable high school students cover the mathematics implied by a., in three years, preferably in grades nine, ten, and eleven, or before.

d. We recommend that all college-capable students with interests in the direction of exact science or engineering or behavioral studies take a fourth year of mathematics in high school.

e. Concerning the content of this fourth year of high school mathematics (grade twelve), we recommend experimentation with course offerings subject to the following condition: The school mathematics program should supply all the precalculus mathematics needed by students who might begin their college mathematics with calculus. (In Part 8 of this section we suggest some topics suitable for such experimental courses.)

f. Both for intrinsic reasons and as a base for the work suggested in a., we recommend the introduction in grades seven and eight of a new mathematics program which gives deliberate scope to intuition and heuristic, and which connects directly with the material to come in grades nine, ten, and eleven.

g. To make our position clear on two perennial issues, we add the following: We recommend that solid geometry be dropped as a separate course, its essentials being incorporated into the work on plane geometry; and we recommend that trigonometry be dropped as a separate course, its elements being dispersed partly into the geometry course, partly into the eleventh grade course, and partly into additional work on functions in grade twelve.

2. *Recommendations concerning mathematical and didactic procedures*

The primary aim of the school mathematics program is to increase the student's mathematical power, that is, to increase his mathematical knowledge, his mathematical skill, and his mathematical insight. Our recommendations on subject matter have indicated specific areas of mathematics in which the student must have knowledge and skill. However, a student's progress through the program should see not only an increase in his information and facility respecting these recommended areas, but also a proportionate increase in his mathematical insight, his problem-solving sense, and his capacity for mathematical invention. These last matters connect with the values of mathematics, and are vitally affected by the organization of the program, the treatment of its topics, and the procedures of the classroom.

a. We recommend that the program be organized so as to promote a view of mathematics as a single subject, not a collection of isolated techniques.

b. We recommend the careful and correct use of unifying ideas such as set, variable, and function; and a judicious use of deductive reasoning in both algebra and geometry. ("Deductive" here suggests simply "follows from", not "axiom".)

c. We recommend for the various topics of the program a presentation that looks to underlying concepts as well as to the inculcation of knowledge and skill.

d. We recommend that formal treatments of concepts and topics, and formal methods such as axiomatics, be deliberately grounded in concrete examples phrased in intuitive terms and discussed heuristically.

e. We recommend the systematic and imaginative use of problem-solving throughout the program, both to exhibit mathematical activity to the student and to engage him in the same.

3. *Recommendations concerning general curriculum policies*

a. It is our conviction that the three-year core program recommended (in a., b., and c. of Part 1) for college-capable students represents the proper locus for the mathematical studies of all high school students. However, we recognize that high school students differ widely in their ability to learn mathematics, and that even those of comparable ability differ significantly in the rate at which they learn mathematics. We therefore recommend that the more deliberate learners and the not-college-capable students be separated out and conducted more slowly through an appropriate initial portion (the first half or two-thirds) of the recommended three-year core program. To phrase this recommendation in other terms: a two-track curriculum scheme is to be expected and encouraged in high school mathematics.

b. Since the number of mathematics students has to be increased at all levels, attention must be given not only to the efficiency of the curriculum but to the proper motivation and guidance of students as well. Guidance comes from many sources, among them high school administrators and counselors. We recommend that such official advisers be made fully aware of the central role of mathematics in many fields and vocations; of the unfortunate consequences of stopping work in mathematics too soon; and of the value of a general education in fundamentals for maximizing the number of career choices open to a high school graduate.

c. The efficiency of a school mathematics curriculum is measured not only in terms of the quality of the student it produces, but also in the provisions it is able to make for enrichment of course work and for acceleration of apt students through the program.

We favor provisions in both directions. In particular, we recommend the systematic use of honors sections, beginning with grade eight, and the establishment of extra-curricular mathematics clubs. We recommend that qualified students be encouraged to take mathematics in summer school, that where possible, extra optional courses be available for election during the regular school term, and that qualified students in grade twelve be encouraged to take calculus at local colleges. And we recommend, where feasible, the introduction of the Advanced Placement Program under appropriate safeguards.

d. The institution of a new school mathematics program carries with it an important educational problem: What shall be the relation of the mathematics program to the science courses (themselves perhaps newly revised) of the high school curriculum? We regard a constructive solution of this problem to be of prime importance for both science and mathematics, and recommend that the problem receive prompt and careful consideration.

4. *Particular remarks on mathematics for grades seven and eight*

The program in mathematics for grades seven and eight must be conceived as one built on the learning in the elementary school. Its primary purpose is to develop informally the mathematical basis for continued study of mathematics in the years beyond. Since the program must serve all students, and in these grades the school population shows great divergence in acquired knowledge and in ability to acquire knowledge, the program must provide for the development of mathematical proficiency at different rates.

After a careful and intensive study, the present program for grades seven and eight must be replaced by one reoriented to a sequential development of mathematical ideas that are useful and important to the projected needs of our society. The mathematics is basic, the applications are used to reinforce and develop the mathematical concepts and skills. Source materials indicating the nature of such a new program can be found at present in the University of Maryland and School Mathematics Study Group experimental texts, and in the first unit of the University of Illinois Committee on School Mathematics, First Course.

The new program should be conceived as two years of study pursued by the large average group. Slower learners should restudy arithmetic from new points of view and continue through the recommended program over three years or a longer time if necessary. The most able students may complete the study in less than the normal two-year period and enter into the more formal study of algebra.

5. *Particular remarks on mathematics for grade nine*

For the ninth year of school, college-capable students should study algebra reoriented towards a modern point of view. For example, the notion of a field should enter here, at least implicitly, as an organizing concept for operations and their properties; inequalities should be treated on the same level as equations; and sets should have their proper role. Source materials indicating the nature of this part of the program can be found in the publications of the School Mathematics Study Group, the University of Illinois Committee on School Mathematics, and the Commission on Mathematics of the College Entrance Examination Board.

Courses in grade nine with such titles as "business mathematics," "consumer mathematics," "shop mathematics," "general mathematics," and the like, as frequently presented, should be dropped in favor of a more rewarding mathematical study. The students for whom these courses are intended are presumably not ready to study the proposed new program in algebra. For these students, a special course must be devised which conforms to the new ninth grade algebra program but proceeds at a slower pace, with more application and with omission of the more abstract elements.

6. *Particular remarks on mathematics for grade ten: geometry*

We agree in principle with the recommendations of the Commission on Mathematics concerning the study of geometry. We do this with the understanding that there should be no intent to deemphasize the place of geometry in mathematical education. Geometric patterns are quite as important as algebraic patterns of thought; indeed, the two are not unrelated, and geometric patterns are frequently useful in algebraic as well as in analytical thinking. Material published by the School Mathematics Study Group, the Commission on Mathematics, and others, should be considered as the basis for designing the geometry course on an experimental basis. In this connection we wish to add the following:

a. Experimental and intuitive geometry should be introduced at seventh and eighth grade levels in connection with problems of measure of segments and angles, problems in mensuration, and elementary ruler and compass construction.

b. Algebraic and analytical tools not available to Euclid should be used. On the other hand, a large core of synthetic deductive geometry is intrinsically valuable for both content and method; a large portion of this body of geometric theorems–some of them phrased as "open-ended" propositions–should be left for the student to develop.

c. Solid geometry should disappear from the curriculum as a separate course, and should be integrated with plane geometry

wherever possible; the geometry course could well include specific units on solid geometry.

d. The geometry course should contain an introduction to the subject of analytical geometry, including such items as pertain to the elementary notions of directed distance, vectors, and the elements of geometric trigonometry.

7. *Particular remarks on mathematics for grade eleven*

We recommend that the aims of the eleventh grade mathematics course be selected from the following: Development of a more systematic view of the various kinds of numbers (natural, integral, rational, complex) with the help of generic concepts such as closure, commutativity, distributativity, and the like; strengthening of algebraic skills through the twin themes of solving equations and transforming expressions, the treatment here being co-ordinate with the generic succession of the number systems (transformation of radical expressions and solution of radical equations first discussed systematically in the context of real numbers); introduction of the concept of function, and its elaboration in terms of linear and quadratic functions and, briefly, exponential and logarithmic functions and sequence; treatment of mathematical induction and of arithmetic and geometric series with some attention to intuitive notion of limit in connection with sequences and series; introductory treatment of circular functions and their fundamental properties, and some applications to geometric trigonometry and to vectors and to complex numbers.

We endorse the eleventh grade mathematics program outlined by the Commission on Mathematics, and recommend it as a point of departure for the construction of a course with the aforementioned aims. The eleventh grade materials of the School Mathematics Study Group should also be consulted. In connection with the Commission's outline we have two remarks to make:

a. Mathematical induction should appear in the eleventh grade course, and should precede discussion of series; and

b. It would bring about great clarification and simplification if a symbol were introduced for the identity function (such a symbol would obviate the necessity of "mental reservations" in naming functions).

8. *Particular remarks on mathematics for grade twelve*

Our general recommendation on mathematics for grade twelve (e. in Part 1 of this section) urged that at this level schools experiment with mathematics courses without forgetting their special obligation to students who might begin college mathematics with calculus. Modern developments in mathematics have made it possible for high school students who complete the recommended

three-year core program to study with profit mathematical subjects that do not lie in the direction of calculus. We favor experimental courses in these directions. Nevertheless calculus remains the capstone of elementary mathematics, and the subject sure to be studied by an overwhelming majority of the high school graduates who continue with mathematics. The first experimental courses we recommend for grade twelve, therefore, are courses which supply the final preparation for the study of calculus: an experimental course in elementary functions and their properties, and an experimental course in co-ordinate (analytical) geometry. The principal noncalculus directions for experimental courses are suggested by modern algebra and by probability; here we recommend an experimental course in co-ordinate (linear) algebra, and an experimental course in probability and statistics.

These recommendations do not pretend to exhaust the areas suitable for experimental course work at the twelfth grade level; for example, another suitable area is that of graphical (prelimit) calculus. Nor do we wish to suggest that experimentation be confined to the twelfth grade. Somewhere in the curriculum we should like to see a significant experiment in teaching real numbers.

V. Our Recommendations Concerning Institutional Arrangements

That there is a severe shortage of competent school mathematics teachers is by now a commonplace. The shortage of teachers is likely to continue; one reason for this is the steady increase in school population, another is the sharp and growing competition from industry and government for mathematically trained graduates, and a third is the comparatively small appeal that the teaching profession has in comparison with the better paying opportunities in nonteaching fields. There is also the danger that recruits into school mathematics teaching will not for the most part be among the stronger mathematics graduates. In the matter of teachers' mathematical competence, a further observation is in order. Proficiency in subject matter, an obvious necessity for effective teaching, has not hitherto been as evident a characteristic of the school mathematics teaching profession nor as central an aim of the teacher training curriculum as it should have been; however, a new school mathematics program simply cannot be instituted and developed without teachers who are mathematically competent. The recommendations we make in this section look to arrangements that seem necessary if mathematical competence is to become a larger factor in qualification for school mathematics teaching, and if there is to be any prospect of reducing the shortage of mathematics teachers.

1. *Our general recommendations*

   a. We urge that the State Department of Education intensify its effort to make the school teaching profession attractive to po-

tential teachers and satisfying to practicing teachers, beginning with the preparatory training program and carrying through to the functions, perquisites, and status of the profession itself.

b. We recommend that the State Department of Education give a strong lead to the appropriate state agencies in such matters as continued retraining for the present corps of mathematics teachers, recasting certification requirements, raising minimal standards of mathematical proficiency for prospective teachers, and modernizing the teacher training curriculums.

c. We recommend that the State Department of Education devise a form of permanent liaison between mathematicians, teachers of school mathematics, and school administrative officers, with a view towards furthering the improvement of school mathematics instruction and maintaining a school mathematics program that appropriately reflects the best thinking in mathematics.

2. *Particular remarks on continued training for practicing teachers*

The institution of a new school mathematics program, even if it be done gradually, is bound to find many practicing teachers uncertain of the new concepts and unsure of their ability to teach them properly. In-service and summer training programs have proved effective in removing uncertainty and insecurity of this sort. We recommend that such training programs be established, and that they deal directly with the new subject matter the teacher is to present in his classroom. We recommend that, where possible, these training programs be conducted through the state colleges and universities. And we recommend that the State Department of Education and the local school districts finance these programs out of their own resources and out of resources that may be obtained from the National Science Foundation or under the National Defense Education Act.

3. *Particular remarks on recruiting and training prospective teachers*

Recruitment of mathematics teachers from a fairly large group of well-prepared persons can be greatly stimulated by the development of interne programs, now in effect at some colleges and universities. Such programs are particularly attractive to graduates who decide to enter the teaching profession after having completed an undergraduate program that was not planned with teaching as an objective. We recommend continued and expanded effort and experimentation in this direction.

The absolute necessity of at least minimal competence in subject matter leads us to recommend that teachers of ninth and tenth grade mathematics be required to have the equivalent of a strong minor in mathematics, and that teachers of eleventh and twelfth grade mathematics be required to have the equivalent of a strong

major in mathematics. This recommendation derives additional force from the fact, already mentioned, that the high schools will be responsible for a larger part of the mathematical training of students as precalculus mathematics is dropped from college programs.

Revision of the school mathematics curriculum makes mandatory a revision of the teacher training program. We strongly recommend that the teacher training program include serious study of modern algebra and geometry at the postcalculus level, and in addition a study of logic, set theory, probability, and statistics. The study of modern algebra and geometry is especially essential to prospective teachers of ninth and tenth grade mathematics; a teaching minor should therefore include these subjects. Should the objection of a crowded program be raised against this recommendation, we remark that the topics mentioned have a greater importance for teachers than some of the traditional postcalculus subjects.

THE USE OF SPECIAL TEACHERS IN SCIENCE AND MATHEMATICS IN THE ELEMENTARY SCHOOLS[1]

JAY DAVIS CONNER

The problem of adequate teaching in mathematics and science at the elementary school level has at least three dimensions. The first and most important of these dimensions is how to get enough teachers who are adequately prepared to teach either arithmetic or science; the second, how to get the time to do a really effective job of instruction; and the third, how to get the curriculum organization needed to insure content and methods reflecting the best we now know about the two subjects and how they may best be taught.

One of the larger cities in California gives qualifying examinations as part of its teacher recruitment procedure. Recently, in one of these examinations, some 20 per cent of the applicants failed to receive a passing grade on the arithmetic section.

Almost all the evidence I have examined points to the fact that elementary school teachers dislike arithmetic. This evidence would suggest that the reason for their dislike is their own fear, based upon a realization that they themselves do not feel adequate or secure in the subject field.

The situation is compounded in the field of science. My guess is that in the typical California school district it would be impossible to find in the ranks of the entire teaching staff of the elementary schools enough teachers with either a major or minor in science or mathematics to staff even a strictly departmentalized program below the seventh grade level.

We who are directly responsible for the elementary school program are being roundly criticized by some of our colleagues in the colleges and universities for permitting this condition to exist. However, the finger of blame actually points at no one so much as the college and university people who would have it point at us. Colleges and universities of our nation need seriously to review their whole system from the standpoint of their obligation to provide the preservice educational opportunities which will really prepare teachers for competent service in our schools, both public and private.

The fact is that the professor who wants to be interested in teacher education or who devotes much time to the training of teachers is penalized for doing so because of the system of higher education that has developed in our country. In the higher education hierarchy of professorial rank, promotion comes primarily upon the basis of research and

[1] From an address given at a conference of the American Association for the Advancement of Science, May 15, 1960, by Dr. Conner, then Associate Superintendent of Public Instruction; and Chief, Division of Instruction, California State Department of Education.

writing. Apparently it is beneath the dignity of most full professors to teach teachers, and the younger faculty members dare not jeopardize their chances for recognition and promotion by devoting a great deal of time and energy to this field of teacher preparation.

This problem is reflected not only in the preservice preparation of teachers, but also in the availability of faculty for contributing to the in-service education of teachers. There will be no solution to this problem so long as the system of higher education in our country is operated on a value system which places the preparation of teachers at the bottom of the list. If it is in the national interest to improve the quality of education in mathematics and in science, I think it might be advisable to start with our system of higher education to correct the fundamental problem of teacher supply.

The employment of special teachers for mathematics and science is not necessarily the answer to our problem at the elementary school level. The need for competent teaching in mathematics or in science is not recognized as being any greater than that for competent teaching in other branches of the curriculum of the elementary school. For example, competent teaching in the social studies is every bit as important as it is in either of the subject fields that are receiving special consideration at this meeting. Neither is there evidence at this moment that a much better job is being done in teaching the social studies than is being done in mathematics or science. If it makes sense to provide departmentalized instruction in arithmetic and in science, why does it not make equal sense to provide it in other fields? The social studies, which require for competent teaching some knowledge of eight disciplines, pose a need for competence of much greater breadth than is required for teaching arithmetic.

So far there has been little consideration of the possibility that closed circuit television needs study as a possible means of bringing expert technical instruction to pupils at the elementary school level. The experimentation now going on in California would indicate that we have not even scratched the surface of the potential of this new medium of instruction. Of course, no mechanical medium can perform the entire teaching act, which is comprised of two parts. One of these parts involves the transmission of information. This television can do, and by all current information available, at least as effectively as a classroom teacher, and in many situations a great deal better. The other part involves human interaction between a mature person, knowledgeable in the field, and a learner. This interaction is the artistic phase of teaching, because it involves appraisal and assessment of individual reaction to the teaching stimulus; judgment regarding insight, perception, and attitudes of acceptance or rejection; and readiness for new experiences or need for reteaching and more time on the sharpening of understandings. This part of the teaching act can never be done by any mechanical means.

The notion, therefore, that television can ever displace the teacher reflects a completely false appraisal of this new medium. Nevertheless, and with its limitations fully understood and accepted, closed circuit television offers the possibility of bringing to every classroom in a school system a quality of instruction, considered solely from the standpoint of the transmission of information, which cannot be secured by any method of teacher assignment that we now know.

The failure of the average educator to distinguish between open circuit and closed circuit television is disturbing, even depressing. Open circuit television such as we see on our home TV sets has limited utility for education, because no more than one program can be sent out at any one time by a station. Therefore, if the station is broadcasting a program of fifth grade arithmetic, nothing else can be broadcast during this time. Closed circuit television, however, because of its use of the coaxial cable, can be used to transmit five programs simultaneously, and by the simple addition of more cables, a system can be set up in any school district in which any desired number of programs can be sent out simultaneously. Closed circuit television, with the addition of video tape, and with the further addition soon of the teaching machine, of which several prototypes are available and more will be coming shortly, offers a method for solving the problem of technical quality of instruction. This deserves our most careful attention. We have not even begun to recognize the potential we have here for improving instruction.

Any attempt to improve the quality of instruction must recognize and provide for balance between two requirements for good teaching—knowledge of the subject, and knowledge of children and how they learn. California elementary schools are largely committed to the philosophy of the self-contained classroom below the seventh grade level, because in their experience they have found that the best guidance and learning in the early grades can be secured only when the same teacher works full time with a group of pupils. Departmentalized teaching in grades one through six was discarded because it did not permit the kind of guidance of learning in a broad field of experience which is necessary to the best development of young childern. It therefore seems unreasonable to assume that the deficiencies of the self-contained classroom can be eliminated by returning to a system which has already been tried and found to be unsatisfactory. To be successful, any proposal to increase the competence and effectiveness of classroom instruction at the elementary school level must be based upon the improvement of teachers' competence in the present organizational structure of the elementary schools. This may involve the use of special teachers, or it may involve the use of other media to assist the regular teacher, but I hope it does not mean a return to rigid departmentalization of the type I knew when I first entered this profession.

Departmental Communications

OFFICE OF THE SUPERINTENDENT OF PUBLIC INSTRUCTION

ROY E. SIMPSON, *Superintendent*

THE BIBLE IN CALIFORNIA PUBLIC SCHOOLS

Questions regarding the use of the Bible in California schools and particularly the distribution of the Gideon Bible through the schools arise so often that a brief review of an opinion given by the Attorney General of California, June 10, 1955, merits particular attention.

In this opinion (25 Ops. Cal. Atty. Gen. 316) the Attorney General answered each of the three questions that follow:

1. Is it permissible to read, without comment, excerpts from a recognized version of the Bible in the public schools of California as a part of the school program?
2. May the Gideon Bible be distributed in the public schools of California?
3. May the governing board of a public school district require that each teacher read a prayer to the class each morning, in the following form: "Almighty God, we acknowledge our dependence upon Thee and we beg Thy blessings upon us, our teachers, our homes and our country?"

The Attorney General summarized his answers to each of the three questions as follows:

1. The Bible may not be read in public school classes for religious purposes. It may be used for reference, literary, historical, or other nonreligious purposes.
2. The Gideon Bible may not be distributed through the public school system.
3. Religious prayers may not be made a part of the curriculum of the public schools.

APPOINTMENT TO STAFF

MILDRED M. BRACKETT was appointed Consultant in School Library Services, Bureau of Audio-Visual and School Library Education, California State Department of Education, July 1, 1960. Miss Brackett has been organizing the services to be offered by the Bureau in guiding school districts in a program of school library education since January, 1960, when the position was first established.

Prior to coming to Sacramento in 1950, to accept the position of Director of Library Services, Office of the County Superintendent of Schools, Sacramento County, Miss Brackett was the County Librarian for Spokane, Washington. She received her bachelor of arts degree from the University of Idaho, and is a graduate of the University of Washington Library School. Her experience also includes teaching, and

library work in schools, public libraries, and as an army hospital librarian at Baxter General Hospital during World War II. Miss Brackett has been active in the School Library Association of California, and served as President of the Northern Section, 1954-55. She is also a member of the California Teachers Association and the California Library Association.

REGULATIONS ADOPTED BY SUPERINTENDENT OF PUBLIC INSTRUCTION

County School Service Fund Formula for Supervision of Instruction, Health Services, and Pupil Personnel Services. The Superintendent of Public Instruction, acting under the authority of Education Code Section 18351 (i), added Section 1516 to Title 5 of the California Administrative Code, relating to the county school service fund formula, to read as follows (effective July 29, 1960):

1516. *Allowance on Account of Newly Formed Unified Districts.* Whenever a unified district has been formed from territory of a county or counties in which there has been included one or more districts which, during the year prior to unification, had less than 901 units of average daily attendance if an elementary district, less than 301 units of average daily attendance if a high school district, or less than 1,501 units of average daily attendance if a unified district, hereinafter in this section called "small districts," and which upon unification has more than 1,500 units of average daily attendance, and the unified district has become effective for all purposes on or after July 1, 1960, the Superintendent of Public Instruction shall, during the second year that the unified district is effective for all purposes and for each year thereafter, allow to the county school service fund of the county or counties affected, the difference between the amount allowed to the county school service fund pursuant to Sections 1510, 1511, and 1512 on account of the districts included in the unified district during the year the unified district was first effective for all purposes, and the product of the units of average daily attendance in the small districts included in the unified district during the year prior to unification, plus the growth in average daily attendance in the unified district, multiplied by ten dollars ($10).

The allowance made to a county school service fund pursuant to this section, may in accordance with Education Code Section 20105, be apportioned by the county superintendent of schools, with the approval of the county board of education, to the unified district on account of which the allowance was made.

Audio-Visual Services. The Superintendent of Pubic Instruction, acting under the authority of Education Code Section 18351 (i), amended Sections 1528 and 1529 of the California Administrative Code, relating to audio-visual services, to read as follows (effective July 29, 1960):

1528. *Audio-Visual Services.* For the purpose of providing audio-visual services to contracting districts in a county as provided by Education Code Sections 8851-8856, the Superintendent of Public Instruction shall allow the amount requested by the county superintendent of schools or the amount contributed by districts in the county during the preceding fiscal year for audio-visual services, whichever is the lesser.

Beginning with 1961-62, amounts contributed by districts during the preceding year for the special purpose of matching federal funds for a project under Title

III of the National Defense Education Act of 1958 shall be excluded when computing the allowance under this section.

1529. *Audio-Visual Funds Restricted.* The allowances, federal allocations and contributions for audio-visual services shall be kept as a restricted portion of the county school service fund of the county and shall be expended only for audio-visual purposes.

Standards for Child Care Centers for Mentally Retarded and Physically Handicapped Children. The Superintendent of Public Instruction, acting under the authority of Education Code Section 16645.4, added Article 16.1 (Sections 150 to 154, inclusive) to Title 5 of the California Administrative Code, relating to standards for child care centers for mentally retarded and physically handicapped children, and adopted the same as an emergency regulation to read as follows (effective June 29, 1960):

Article 16.1. Standards for Child Care Centers for the Mentally Retarded and Physically Handicapped

150. *Definition.* (a) Mentally retarded and physically handicapped child care centers as herein used refers to child care centers for the care and guidance of children as authorized by Article 2 of Chapter 5 of Division 12 of the Education Code and includes day care and guidance for minors on any day.

(b) Mentally retarded and physically handicapped child care centers for purposes of this article shall be subject to the same rules and regulations as are now in effect for child care centers except as contained in this article.

151. *Personnel.* To provide proper supervision for the care and guidance of children in a mentally retarded and/or physically handicapped child care center, the governing board of a school district shall employ at least one person in each center who holds a Plan A child care permit and in addition holds a valid California credential authorizing the holder to serve as a teacher of mentally retarded or orthopedically handicapped including cerebral palsied children.

151.1. *Specialized Personnel.* Specialized personnel including but not limited to nurses, therapists and psychiatric technicians may be assigned duties by the governing board of the district as it is deemed necessary to perform specialized functions relating to handicapped children. The holding of a valid appropriate license authorizing the service to be performed shall be deemed to be the issuance of a valid permit.

152. *Records on Applicants to Child Care Centers for Mentally Retarded and Physically Handicapped Children.* (a) The governing board shall obtain from the parent or guardian of each child for whom admission to such a center in the district is requested the information required in the application form set forth in Section 149 and such other information as may be required by the board to determine the eligibility of the child. Information so procured shall be confidential except that the governing board of the district shall, upon request, make such records available to the State Department of Education.

(b) The governing board may require and shall keep such additional information and records regarding applicants as in the judgment of the board are necessary to fulfill the criteria established in Section 153.

153. *Eligibility of Children for Admission.* (a) The governing board of a school district shall appoint an admissions committee consisting of at least three members, one of whom shall be a physician and surgeon and one shall be from the field of special education as specified in Article 36 of this code.

(b) The assignment of a handicapped child to a child care center shall be made upon the recommendation of the admissions committee. The assignment of minors may be conditional, subject to review by the admissions committee.

(c) The determination of eligibility of a minor for admission to a child care center for mentally retarded and physically handicapped children shall include examinations given by a psychologist or psychometrist and a licensed physician and

surgeon. He may be eligible if he is found to have one or more of the following conditions:

(1) Serious impairment of locomotion; or
(2) Severe orthopedic conditions, or
(3) Other severe disabling conditions; or
(4) Serious mental retardation.

(d) One criteria for eligibilty for admission to a child care center shall be the ability of the minor to participate in at least one aspect of the program without danger to himself or others in the performance of daily activities.

154. *Records and Reports.* (a) Records of the operation and administration of child care centers shall be kept and such reports made as shall be required by the Superintendent of Public Instruction.

(b) Individual case records shall be kept for all children placed in child care centers for mentally retarded and physically handicapped children. Records so procured shall be confidential except that the governing board of the district shall, upon request, make such records available to the State Department of Education.

Retention and Destruction of Cumulative Records by County Superintendents of Schools and School Districts. The Superintendent of Public Instruction, acting under the authority of Sections 807 and 1113 of the Education Code, amended Sections 3002, 3003, 3016, and 3017 of Title 5 of the California Administrative Code, relating to cumulative records of pupils, to read as follows (effective July 1, 1960):

3002. (l) *Cumulative Records of Pupils.* The cumulative record of a pupil defined in Section 80 which was either prepared by, or transferred to, the office of the county superintendent of schools, unless the record or a copy therefor has been transferred by request pursuant to Education Code Section 10752 or the record or a copy thereof has been transferred at the discretion of the county superintendent of schools by request to an officer or employee described in subsections (c), (d), or (e) of Education Code Section 10751.

If the county superintendent of schools has not maintained a separate record fulfilling the requirements of subsection (a) of Section 79, he shall, before transferring an original cumulative record, cause a separate record to be compiled by copying therefrom by manual or photostatic means the items of information required by subsection (a) of Section 79, and shall thereafter maintain the separate compiled record as provided in subsection (k) hereof.

3003. (e) *Cumulative Records of Pupils.* The cumulative record of a pupil defined in Section 80 which was either prepared by, or transferred to, the office of the county superintendent of schools, shall be preserved by that office until it is transferred pursuant to Education Code Section 10751 or 10752. If for any reason a cumulative record is not transferred when a pupil leaves or completes school and the county superintendent of schools determines that retention of the record would serve no further purpose, such record may then be destroyed, except that the information required by Section 79 (a) shall be retained.

3016. (l) *Cumulative Records of Pupils.* The cumulative record of a pupil defined in Section 80 which was either prepared by, or transferred to, the school district or to a school therein, unless the record or a copy thereof has been transferred purusant to Education Code Section 10752 or the record or a copy thereof has been transferred at the discretion of the school district by request to an officer or employee described in subsection (c), (d), or (e) of Education Code Section 10751.

If the principal or the school district has not maintained a separate record fulfilling the requirements of subsection (a) of Section 79, the principal or the school district shall, before transferring an original cumulative record, cause a separate record to be compiled by copying therefrom by manual or photostatic means the items of information required by subsection (a) of Section 79, and shall thereafter maintain the separate compiled record as provided in subsection (k) hereof.

3017. (e) *Cumulative Records of Pupils.* The retention period for the cumulative record of a pupil defined in Section 80 is the period prior to transfer of such

record pursuant to Education Code Section 10751 or 10752. If for any reason a cumulative record is not transferred when a pupil leaves or completes school and the chief administrator of the district determines that retention of the record would serve no further purpose, such record may then be destroyed, except that the information required by Section 79 (a) shall be retained.

EMERGENCY REGULATION ADOPTED BY DIRECTOR OF EDUCATION

Refund of Summer Session Tuition Fees. The Director of Education, acting under the authority of Education Code Section 23752, and with the approval of the Director of Finance, amended Section 950 of Title 5 of the California Administrative Code, relating to the refund of summer session tuition fees, and adopted this as an emergency regulation to read as follows (effective May 10, 1960):

950. (c) (3) (C) Summer session tuition fee—Not later than the end of the second week of the session for which the student is registered.

(e) (6) Summer session tuition fees, in accordance with the formula herein set forth.

FORMULA FOR REFUND

Time of withdrawal	*Refund*
Five-Week Session or Longer	
First two days college classes are scheduled	(Total fee paid minus the fee for one semester unit)
Any other day of the first week	(Total fee paid minus the fee for one semester unit) times 65%
Any day of the second week	(Total fee paid minus the fee for one semester unit) times 25%
Three and Four-Week Sessions	
First two days college classes are scheduled	(Total fee paid minus the fee for one semester unit)
Any other day of the first week	(Total fee paid minus the fee for one semester unit) times 65%
Two-Week Session or Less	(No refund)

For Your Information

STATE BOARD OF EDUCATION ACTIONS

The following actions were taken by the State Board of Education at its regular meeting held in San Diego, July 7 and 8, 1960.

Changes in Rules and Regulations

Cumulative Records. The Board, acting under the authority of Education Code Section 10752, amended Sections 80 and 80.1 of Title 5 of the California Administrative Code, relating to cumulative records, and adopted the same as an emergency regulation to read as follows (effective July 1, 1960):

80. (c) If items of information that are required by Section 79(a) to be kept permanently in the school are recorded on separate forms, such items shall either be entered on the cumulative record or a duplicate copy thereof shall be attached to the cumulative record whenever it is transferred, except that subjects taught and marks or credits given in the elementary schools may be recorded in summary form as of the date of transfer for transmittal with the cumulative record.

80.1. *Requirement.* A cumulative record shall be maintained for each pupil enrolled in programs of instruction leading to a certificate, diploma, or degree in the public schools in California subsequent to July 1, 1960.

Approval of Reappointments to State Curriculum Commission

The Board approved the reappointment by Superintendent of Public Instruction Roy E. Simpson of Mrs. Martha K. McIntosh and Kenneth P. Bailey as members of the State Curriculum Commission for four-year terms beginning August 30, 1960.

Approval of Appointments and Reappointments to Advisory Boards for State Colleges

In accordance with Education Code Sections 23651 through 23658, the Board confirmed the appointment and reappointment by the Director of Education Roy E. Simpson of the following members of the advisory boards for three state colleges, for terms ending September 30 of the years indicated.

HUMBOLDT STATE COLLEGE ADVISORY BOARD

Chester W. Connick, Vice President, Bank of America, 334 F Street, Arcata (1964)

Kirk Cooper, General Manager, Roddiscraft Plywood Corporation, Arcata (1964)

Gilbert Oswald, Vice President and General Manager, Simpson Redwood Company, Arcata (*vice* J. J. Krohn) 1962

William T. Patton, Manager, Hughes Chevrolet Company, 14th and N Streets, Fortuna (1964)

SAN FERNANDO STATE COLLEGE (NORTHRIDGE) ADVISORY BOARD

Nathan O. Freedman, Attorney, 9453 Van Alden, Northridge (1964)

Ferdinand Mendenhall, Managing Editor and Copublisher of the *Van Nuys News* and the *Valley News*, 13830 Chandler Boulevard, Van Nuys (1964)

SAN JOSE STATE COLLEGE ADVISORY BOARD

B. Floyd Farr, Vice President and General Manager, United Broadcasting Company, Radio Station KEEN, 233 West Santa Clara Street, San Jose (1964)

Warren B. Reilly, Robinson and Sons Furniture, 3530 Stevens Creek Boulevard, San Jose (1964)

Approval of Changes in School District Organization

In accordance with the provisions of Chapter 7 of Division 5 of the Education Code (Section 2560), the Board approved the following proposals regarding changes in school district organization:

A request for permission to hold an election to form a junior college district in Kern County—A proposal by the governing board of the Kern County Joint Union High School and Junior College District that an election be held to determine whether the voters in this district wish to form a junior college district which will include all the district territory.

A request for permission to hold an election to form a junior college district in Los Angeles County—A proposal by the governing board of the Whittier Union High School District that an election be held to determine whether the voters in this district wish to form a junior college district.

In accordance with the provisions of Chapter 9 of Division 5 of the Education Code (Section 3152) the Board approved the following proposals regarding changes in school district organization:

Formation of a junior college district in Los Angeles County—A proposal by the Los Angeles County Committee on School District Organization that an election be held to determine whether the voters in the Citrus Union High School District wish to form a junior college district.

Annexation of an elementary school district to another elementary school district in Los Angeles County—A proposal by the Los Angeles County Committee on School District Organization that an election be held to determine whether the voters in the Sierra Madre City Elementary School District wish to annex their school district to the Pasadena City School District.

In accordance with the provisions of Chapter 9 of Division 5 of the Education Code (Section 3151), the Board approved the following proposals regarding changes in school district organization:

Formation of a unified school district in Los Angeles County—A proposal by the Los Angeles Committee on School District Organization that an election be held to determine whether the voters in La Canada Elementary School District wish to form a unified school district.

Formation of a unified school district in Los Angeles County—A proposal by the Los Angeles County Committee on School District Organization that an election be held to determine whether the voters in the Palos Verdes Elementary School District wish to form a unified school district.

Formation of a unified school district in Los Angeles County—A proposal by the Los Angeles Committee on School District Organization that an election be held to determine whether the voters in the Wm. S. Hart Union High School District wish to form a unified school district.

Formation of a unified school district in Sutter County—A proposal by the Sutter County Committee on School District Organization, concurred in by the Placer County Committee on School District Organization, that an election be held to determine whether the voters in the East Nicolaus Joint Union High School District, and in the Browns, Marcum-Illinois Union, Nicolaus, and Pleasant Grove Union elementary school districts wish to form a unified school district.

In accordance with the provisions of Chapter 6 of Division 5 of the Education Code (Section 2230), the Board approved the following proposal regarding a change in school district organization:

Formation of a unified school district in Alpine County—A proposal by the Alpine County Committee on School District Organization that an election be held to determine whether the voters in the Alpine County Union School District wish to form a unified school district.

Adoption Period Extended for Civics Textbooks

The Board extended the adoption period of the State textbook in civics, *Living in Our Democracy*, by Vanza Nielsen Devereaux and Homer Ferris Aker, published by Harr Wagner Publishing Company, for a two-year period beginning July 1, 1961, and ending June 30, 1963.

Suspension of Credentials for Public School Service

In accordance with the provisions of Education Code Section 13202, the Board ordered the suspension of each credential, life diploma, and certification document heretofore issued to Mabel Hazel Harbert (birth date 2-11-26), effective June 10, 1960, and continuing until such time, on or after December 1, 1960, as a psychiatrist, chosen by the respondent from a list furnished by the Board, certifies that in his opinion she is fit and competent to teach.

Granting of Credentials to Applicants Whose Previous Credentials Had Been Revoked

The Board approved the granting, subsequent to previous revocation, of a general secondary credential to David James Lewis (birth date 10-7-10); and of a general elementary credential to Bradie Ragsdale Session (birth date 11-3-16), provided that current academic requirements are met.

Revocation of Credentials for Public School Service

The Board revoked the credentials, life diplomas, and other documents for public school service heretofore issued to the following persons, effective on the dates shown:

Name	*Date of birth*	*Revocation effective*	*By authority of Education Code Section*
Adcock, Henry, Jr.	2- 4-30	May 30, 1960	13205
Bonn, Norman N.	6-15-15	June 30, 1960	13205
Ferris, Robert Severs	4-23-19	June 14, 1960	13205
Fisher, Wayne David	8-25-23	May 12, 1960	13205
Hunter, Kenneth Adams	2-27-31	May 12, 1960	13205
Mayse, Harley Ellis	10- 4-26	July 7, 1960	13207
Murphy, Joseph I.	12-21-22	July 7, 1960	13206
Peterson, Myron Clifford	4-10-25	July 7, 1960	13207
Raymond, Eleanor Cook	5-14-37	July 7, 1960	13206
Skanse, Oliver Bodien	5- 8-24	June 1, 1960	13205
Taylor, Dell Kinyon	8- 1-33	June 13, 1960	13205
Thorp, Fred Wallace	7-15-29	June 7, 1960	13205
Thurman, Roland Hayes	2-19-29	March 18, 1960	13205
Zylstra, Harry Robert	3- 9-24	July 7,1960	13207

CALENDAR OF EDUCATIONAL MEETINGS AND EVENTS, 1960-61

The calendar of educational meetings and events for the current school year that is maintained in the office of the Superintendent of Public Instruction is published in *California Schools* to provide a convenient reference for those who may wish to attend the meetings or participate in the observation of holidays and anniversaries listed. Information about events of state-wide or regional significance in the field of education has been supplied by the organizations concerned. Questions regarding the calendar, and correspondence regarding corrections or additions should be addressed to the Superintendent of Public Instruction.

Meetings of the cabinet of the Superintendent of Public Instruction are held on Monday of each week.

Conferences on meetings called by the Superintendent of Public Instruction are marked with asterisks.

CALENDAR OF EDUCATION MEETINGS AND EVENTS, 1960-61

Date	*Organization and Event*	*Place*
September		
5	—Labor Day	
9	—California Admission Day	
12–15	—California Congress of Parents and Teachers, Inc., Board of Managers Meeting	Sheraton-Palace Hotel, San Francisco
15–16	—State Board of Education Meeting	Villa Hotel, San Mateo
22	—California Association of Secondary School Administrators, Executive Board Meeting	Sacramento
23–24	—California Association of Secondary School Administrators, Executive Board and Representative Council Meeting	Sacramento
23	—Audio-Visual Education Association of California, State Board Meeting	Lafayette Hotel, Long Beach
23–24	—California Elementary School Administrators Association, Executive Board Meeting	Rickey's Studio Inn, Palo Alto
24	—California Council for Adult Education, Central Coast Section Meeting	Garden Motel, Salinas
27	—*State Department of Education, Professional Staff Meeting	Sacramento
28	—California Association of School Administrators, Board of Governors Meeting	Sacramento
29	—California Association of School Administrators, Section Chairmen and Administrative Policies Commission Meeting	Sacramento
29	—California Association of School Administrators, Board of Governors Meeting	Sacramento
30	—California Association of School Administrators, Administrative Policies Commission Meeting	Sacramento

CALENDAR OF EDUCATION MEETINGS AND EVENTS, 1960-61
Continued

Date	*Organization and Event*	*Place*
October		
2–8	—California Library Association, Annual Meeting	Huntington-Sheraton Hotel, Pasadena
7–8	—California Elementary School Administrators Association, Central Coast Section Meeting	Monterey
7–8	—Council of California Vocational Associations, Annual Meeting	Sacramento
8	—California Council of Geography Teachers, Executive Board Meeting	Fresno
8	—School Library Association of California, Executive Board Meeting	Huntington-Sheraton Hotel, Pasadena
8–13	—Association of School Business Officials, National Convention	St. Louis, Missouri
9	—School Library Association of California, Section Officers Workshop	Pasadena
11	—Central California Junior College Association, Fall Conference	Taft College
12	—Columbus Day	
13–14	—State Board of Education Meeting, State Teachers Retirement Board Meeting	Kellogg-Voorhis Campus, California State Polytechnic College, Pomona
14–16	—California Aviation Education Association, Annual Board Conference	Fresno
14–17	—National Association Public School Adult Educators	Denver Hilton Hotel, Denver, Colorado
15	—California Association for Childhood Education, Executive Board Meeting	Bakersfield
15	—California Elementary School Administrators Association, North Coast Section Meeting	Crescent City
15	—Northern California Continuation Education Association	San Jose
15	—Elementary School Science Association, Annual Fall Conference	Shasta Junior College, Redding
15	—California Council for Adult Education, Central Section Meeting	Hotel Californian, Fresno
15	—Southern California Junior College Association, Fall Meeting	Santa Monica City College
15–16	—California Business Education Association, Fall Executive Board Meeting	San Francisco
20	—California Association of Secondary School Administrators, Executive Board Meeting	San Francisco
21	—California Elementary School Administrators Association, Central Section Meeting	Fresno
22	—Southern California Continuation Education Association	Los Angeles
24–28	—*California Association for Supervision and Curriculum Development, and California Association of Supervisors of Child Welfare and Attendance, Annual Conference	Sacramento
25	—California Department of Education, Executive Staff Meeting	Sacramento

CALENDAR OF EDUCATION MEETINGS AND EVENTS, 1960-61
Continued

Date	*Organization and Event*	*Place*
October		
25-27—	*California Junior College Association, Annual Fall Conference	Yosemite
27-29—	*California Council on Teacher Education, Fall Conference	Ahwahnee Hotel, Yosemite
27-30—	Future Homemakers Association, State Convention	Asilomar
28-29—	Audio-Visual Education Association of California, Southern Section Meeting	Pasadena City College
29 —	California Council For Continuation Education	Fresno
Oct. 31 to Nov. 2—	*County Superintendent of Schools Association, Fall Conference	Sacramento
November		
2-5 —	*California Association of Adult Education Administrators, Annual Fall Conference	Huntington-Sheraton Hotel, Pasadena
2-5 —	California Speech and Hearing Association, Annual Conference	Statler-Hilton Hotel, Los Angeles
3-4 —	State Board of Education Meeting	California Schools for the Deaf, and California School for the Blind, Berkeley
3-4 —	California Industrial Education Association, Executive Council Meeting	Californian Hotel, Fresno
4 —	California Educational Research and Guidance Association, Emotional Problems and Research Conference	University of Southern California
4-5 —	California Elementary School Administrators Association, Bay Section Meeting	Santa Rosa
4-5 —	California Council for Adult Education, Southern Section Meeting	Huntington-Sheraton Hotel, Pasadena
5 —	California Elementary School Administrators Association, Southern Section Meeting	— — — —
6-12—	American Education Week	
8 —	Election Day	
8-9 —	Western Personnel Institute, Annual Conference of the Academic Council	Pasadena
11 —	Veteran's Day	
11-12—	California Elementary School Administrators Association, Administrative Council Meeting	Hilton Inn, San Francisco
14-16—	California Aviation Education Association, and National Aeronautic Association, Convention	Indio
15-16—	California Congress of Parents and Teachers, Inc., Board of Managers Meeting	Statler-Hilton Hotel, Los Angeles
16 —	California Association of Secondary School Administrators, Executive Board Meeting	Burlingame
16-18—	California State Curriculum Commission Meeting	Death Valley
18-19—	California Council for Adult Education, Annual Fall Conference	Sacramento Inn, Sacramento

CALENDAR OF EDUCATION MEETINGS AND EVENTS, 1960-61
Continued

Date	*Organization and Event*	*Place*
November		
18–19	—California Council for Adult Education, Northern Section Meeting (in conjunction with State Meeting)	Sacramento Inn, Sacramento
19	—Elementary School Science Association of Southern California, Fall Meeting	Oak Grove School, La Canada
24	—Thanksgiving Day	
29	—State Department of Education, Executive Staff Meeting	Sacramento
December		
1–2	—State Board of Education Meeting	San Fernando Valley State College, Northridge
3	—California Elementary School Administrators Association, Central Coast Section Meeting	— — — —
3	—Northern California Junior College Association, Fall Meeting	University of California, Davis
5	—California Association of School Administrators, Board of Governors and Administrative Policies Commission Meeting	Wilton Hotel, Long Beach
6–8	—*California Association of School Administrators, Annual Conference	Wilton Hotel, Long Beach
7–10	—California School Boards Association, Annual Conference	Long Beach
9–10	—California Teachers Association, State Council of Education Meeting	Los Angeles
20	—State Department of Education, Executive Staff Meeting	Sacramento
25	—Christmas	
January		
1	—New Years Day	
7	—California Council of Geography Teachers, Executive Board Meeting	Fresno
10–12	—California Congress of Parents and Teachers, Inc., Board of Managers Meeting	Sheraton-Palace Hotel, San Francisco
16	—California Association of Secondary School Administrators, Executive Board Meeting	Hollywood
18–20	—California State Curriculum Commission Meeting	Bay Area
20–21	—California Elementary School Administrators Association, Executive Board Meeting	Rickey's Studio Inn, Palo Alto
21	—Elementary School Science Association of Southern California, Winter Meeting	Riverside
24	—State Department of Education, Executive Staff Meeting	Sacramento
28	—California Elementary School Administrators Association, Bay Section Meeting	San Francisco State College
28	—California Elementary School Administrators Association, North Coast Section Meeting	Arcata

CALENDAR OF EDUCATION MEETINGS AND EVENTS, 1960-61
Continued

Date	*Organization and Event*	*Place*
February		
2–4	—Audio-Visual Education Association of California, Annual Conference	Lafayette Hotel, Long Beach
3–4	—California Elementary School Administrators Association, Central Coast Section Meeting	San Luis Obispo
4	—California Elementary School Administrators Association, Southern Section Meeting	– – – –
10–11	—California Industrial Education Association, Executive Council Meeting	Californian Hotel, Fresno
11–13	—School Library Association of California, State Convention	Lafayette Hotel, Long Beach
11–15	—National Association of Secondary School Principals, National Convention	Detroit, Michigan
12	—Lincoln's Birthday	
22	—Washington's Birthday	
22–24	—California Personnel and Guidance Association, Convention	Long Beach
24	—California Elementary School Administrators Association, Central Section Meeting	Bakersfield
25–28	—American Association of School Administrators, Regional Conference	San Francisco
March		
1–3	—California State Curriculum Commission Meeting	Fresno
3–4	—California Education Research Association Meeting	Rickey's Studio Inn, Palo Alto
10	—California Association for Childhood Education, Executive Board Meeting	Santa Monica
11–12	—California Association for Childhood Education, Annual Conference	Hotel Miramar, Santa Monica
11–14	—American Association of School Administrators, Regional Conference	St. Louis, Missouri
12–16	—Association for Supervision and Curriculum Development, National Convention	Chicago, Illinois
14–16	—California Congress of Parents and Teachers, Inc., Board of Managers Meeting	Statler-Hilton Hotel, Los Angeles
14–17	—California Industrial Education Association, 23rd Annual Convention	California Hotel, Fresno
18	—Elementary School Science Association of Southern California, Spring Meeting	Los Angeles State College
19–23	—*County Superintendent of Schools Association, Spring Conference	Asilomar
24	—California Elementary School Administrators Association, Administrative Council Meeting	Long Beach
24–25	—*California Association of Secondary School Curriculum Coordinators, Annual Conference	San Diego
24–27	—California Home Economics Association, State Convention	San Francisco
25	—California Aviation Education Association, Air Youth Day Meeting	Los Angeles and San Francisco

CALENDAR OF EDUCATION MEETINGS AND EVENTS, 1960-61
Continued

Date	Organization and Event	Place
March		
25-26	California Elementary School Administrators Association, Executive Board Meeting	Long Beach
25-26	California Association of Secondary School Administrators, Executive Board and Representative Council Meeting	San Diego
25-28	American Association of School Administrators, Regional Conference	Philadelphia, Pennsylvania
25-28	California Association for Health, Physical Education, and Recreation, 28th Annual Conference	Berkeley
26-28	California School Food Service Association Meeting	Hotel Del Coronado, San Diego
26-29	*California Association of Secondary School Administrators, Annual Conference	San Diego
26-29	*California Elementary School Administrators Association, State Conference	Long Beach
28	Central California Junior College Association, Spring Conference	Coalinga
28	State Department of Education, Executive Staff Meeting	Sacramento
April		
2	Easter	
4-8	Council for Exceptional Children, Annual Convention	Detroit, Michigan
6-8	Western Business Education Association, Annual Conference of Ten Western States	Spokane, Washington
7-8	California Teachers Association, State Council of Education Meeting	Asilomar
9-12	*California Association of Public School Business Officials, Annual Conference	Statler-Hilton Hotel, Los Angeles
13-15	*California Council on Teacher Education, Spring Conference	Miramar Hotel, Santa Barbara
15	Southern California Junior College Association, Spring Meeting	Chaffey College, Alta Loma
14-16	California Aviation Education Association, Annual Conference	Long Beach
20-23	California Association of Women Deans and Vice Principals, State Conference	Hotel Villa, San Mateo
21-22	California Elementary School Administrators Association, North Coast Section Meeting	Ukiah
22	Northern California Continuation Education Association Meeting	- - - -
24-28	Public Schools Week	
25	State Department of Education, Executive Staff Meeting	Sacramento
29	California Elementary School Administrators Association, Bay Section Meeting	San Jose State College
29	Southern California Continuation Education Association Meeting	- - - -
29	Northern California Junior College Association, Spring Meeting	- - - -

CALENDAR OF EDUCATION MEETINGS AND EVENTS, 1960-61
Continued

Date	*Organization and Event*	*Place*
May		
1–2	—California Congress of Parents and Teachers, Inc., Board of Managers Preconvention Meeting	Los Angeles
3–5	—California Congress of Parents and Teachers, Inc., State Convention	Los Angeles
5	—California Congress of Parents and Teachers, Inc., Board of Managers Postconvention Meeting	Los Angeles
5–6	—California Council of Geography Teachers, Executive Board Meeting	San Fernando Valley State College, Northridge
6	—California Elementary School Administrators Association, Southern Section Meeting	— — — —
6	—California Council for Continuation Education Meeting	Fresno
12–13	—California Elementary School Administrators Association, Section Leadership Conference	Rickey's Studio Inn, Palo Alto
12–13	—Council of California Vocational Association, Annual Meeting	San Diego
17–19	—California State Curriculum Commission Meeting	Anaheim
18	—California Association of Secondary School Administrators, Executive Board Meeting	Burlingame
19–20	—California Association of Secondary School Administrators, Executive Board and Representative Council Meeting	Burlingame
20	—California Association for Childhood Education, Executive Board Meeting	Bay Area
20–21	—California Elementary School Administrators Association, Bay Section Leadership Conference	Siegler Springs
23	—State Department of Education, Executive Staff Meeting	Sacramento
30	—Memorial Day	
June		
19–21	—California Association of Independent Schools, Annual Meeting	Southern California
20–25	—California Agricultural Teachers Association, Skills Week Meeting	California State Polytechnic College, San Luis Obispo
25–30	—National Education Association, Annual Convention	Atlantic City, New Jersey
26–30	—California Agricultural Teacher's Association, Summer Conference	San Luis Obispo
27	—State Department of Education, Executive Staff Meeting	Sacramento
July		
4	—Independence Day	
August		
27–30	—California Teachers Association, Presidents Conference	Asilomar

TRANSLATIONS OF RUSSIAN ARTICLES ON BIOLOGY AVAILABLE

The American Institute of Biological Sciences announces that with the support of the National Science Foundation it is proceeding with a program of translating foreign language articles on the biological sciences. It is hoped that the material thus made available will aid in research, prevent duplication, and bring about international understanding among scientists. The first part of this program has been the translation of Russian journals and monographs on botany, biochemistry, plant physiology, microbiology, entomology, and soil science. Further information regarding these translations may be obtained by writing to the American Institute of Biological Sciences, 2000 P Street, N.W., Washington 6, D.C.

GEOGRAPHIC SCHOOL BULLETINS

The National Geographic Society has announced that the first of 30 weekly issues of the Geographic School Bulletins for the 1960-61 school year will appear on October 3, 1960. Teachers, librarians, educational workers, students, or parents may subscribe at the domestic subscription rate of $2.00 for 30 issues, October 3, 1960 to May 14, 1961, or $5.00 for 90 issues (three full school years). Teachers may obtain subscriptions for all members in their classes if copies are mailed in bulk to one address. Orders should be addressed to the National Service Division, National Geographic Society, Sixteenth and M Streets, N.W., Washington 6, D.C.

Professional Literature

PUBLICATIONS RECEIVED

The Administration of Safety in the New York City Schools: A Manual. Curriculum Bulletin 1958-59 Series, No. 13. Brooklyn 1, New York: Board of Education of the City of New York, 1960. Pp. xiv + 282. $1.00.

Basic Book Collection for Junior High Schools. MARGARET V. SPENGLER, editor. Chicago 11: American Library Association, 1960. Pp. 136. $2.00.

BECK, ROBERT; COOK, WALTER; and KEARNEY, NOLAN. *Curriculum in the Modern Elementary School, Second Edition.* Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1960. Pp. xii + 516. $7.25.

BULLOCK, ROBERT PERCIVAL. *School-Community Attitude Analysis for Educational Administrators: An Analysis of School Community Attitudes and Their Bearing on Educational Administration.* Columbus, Ohio: College of Education, Ohio State University, 1959. Pp. 112. $2.00.

California and Western Conference Cost and Statistical Study for the Year 1954-1955. Financed by a grant from the Fund for the Advancement of Education. New York 22, N.Y.: Fund for the Advancement of Education, [1960]. Pp. xvi + 130.

CARR, ALDEN J. *Student Participation in College Policy Determination and Administration.* Prepared for the Committee on Studies of the American Association of Colleges for Teacher Education. Washington 6, D.C.: American Association of Colleges for Teacher Education, 1959. Pp. 76. $1.25.

The Challenge of Science Education. Edited by JOSEPH SLABEY ROUCEK. New York 16: Philosophical Library, Inc., 1959. Pp. 492. $10.00.

The Classroom Teacher and Public Relations. Research Monograph Series, 1959-M2, American Educational Research Association. Washington 6, D.C.: National Education Association, 1959. Pp. 38. $0.50.

Conditions of Work for Quality Teaching. Washington 6, D.C.: Department of Classroom Teachers, American Educational Research Association, National Education Association, 1959. Pp. 158. $1.25.

GODBEY, EDSEL T. *The Governors of Kentucky and Education 1780-1852.* Bulletin of the Bureau of School Service, Vol. XXXII, No. 4, June, 1960. Lexington, Kentucky: College of Education, University of Kentucky, 1960. Pp. 128. $1.00.

GOLDSEN, ROSE K. and OTHERS. *What College Students Think.* Princeton, New Jersey: D. Van Nostrand Co., Inc., 1960. Pp. 240. $5.75.

The Healthy Child: His Physical, Psychological, and Social Development. Edited by HAROLD C. STUART, M.D., and DANE G. PRUGH, M.D. Cambridge 38, Mass.: Harvard University Press, 1960. Pp. xvi + 512. $10.00.

KINDRED, LESLIE W. *How to Tell the School Story.* Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1960. Pp. xii + 500. $6.75.

MCCLUSKEY, NEIL GERARD. *Catholic Viewpoint on Education.* Garden City, New York: Doubleday & Co., Inc., 1959. Pp. 192. $3.50.

McGRATH, EARL JAMES. *The Graduate School and the Decline of Liberal Education.* New York 27: Published for the Institute of Higher Education by the Bureau of Publications, Teachers College, Columbia University, 1959. Pp. 66. $1.50.

McLENDON, JONATHON C. *Teaching the Social Studies.* What Research Says to the Teacher Series, No. 20. Washington 6, D.C.: Department of Classroom Teachers, American Education Research Association, National Education Association, 1960. Pp. 34. $0.25.

Music Education for Elementary School Children. Reprinted from the December, 1959 issue of *National Elementary Principal.* Washington 6, D.C.: Music Educators National Conference, 1960. Pp. 40. $1.00.

Music in Everyday Living and Learning: Ways of Integrating Music with Other Experiences. A Report Prepared for the Music in American Life Commission on Music in Preschool, Kindergarten and Elementary School by the Committee on Integrated Activities in Elementary School Music. Edited by ROBERTA McLAUGHLIN. Washington 6, D.C.: Music Educators National Conference, 1960. Pp. x + 54. $1.00.

Operation New York: Using the Natural Environment of the City as a Curriculum Resource. Curriculum Research Report. Brooklyn 1, N.Y.: Board of Education of the City of New York, 1960. Pp. x + 118, $1.00.

Reading Instruction in Various Patterns of Grouping. Proceedings of the annual conference on reading held at the University of Chicago, 1959, Vol. 21. Compiled and edited by HELEN M. ROBINSON. Chicago 37: University of Chicago Press, 1959. Pp. 212. $3.50.

SKINNER, CHARLES EDWARD. *Educational Psychology.* Englewood Cliffs, New Jersey: Prentice-Hall, Inc. (fourth edition), 1959. Pp. 756. $7.95.

Staffing Ratios in California Secondary Schools: A Report of a Study Conducted by the California Teachers Association, California Association of School Administrators, California Association of Secondary School Administrators, and the Bureau of Education Research, State Department of Education. California Teachers Association Research Bulletin No. 131, April, 1960. Burlingame, California: California Teachers Association, 1960. Pp. 60. $1.00.

Time, Talent, and Teachers. New York 22: The Ford Foundation, 1960. Pp. 52.

TRAXLER, ARTHUR E., and JUNGEBLUT, ANN. *Research in Reading During Another Four Years: Summary and Bibliography, July 1, 1953-December 31, 1957.* Educational Records Bulletin No. 75. New York 32: Educational Records Bureau, 1960. Pp. vi + 226.

Workshop on Administration in Higher Education in Relation to Self-evaluation and Accreditation, 1958: Self-evaluation and Accreditation in Higher Education. The proceedings of the Workshop on Administration in Higher Education in Relation to Self-evaluation and Accreditation conducted at the Catholic University of America, June 13-24, 1958. Edited by ROY J. DEFERRARI. Washington 17, D.C.: Catholic University of America Press, 1959. Pp. xii + 362. $3.50.

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